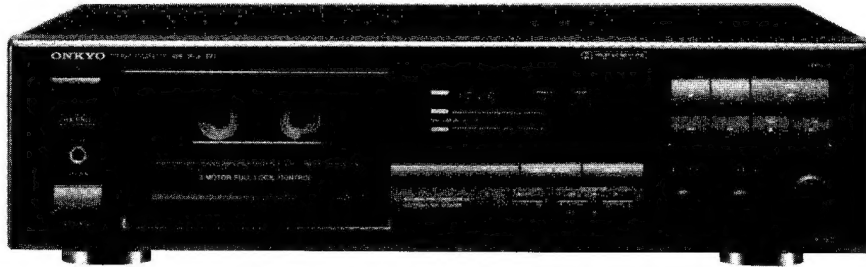


# ONKYO SERVICE MANUAL

## STEREO CASSETTE TAPE DECK MODEL TA-2820



Black model

### SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK  $\Delta$  ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

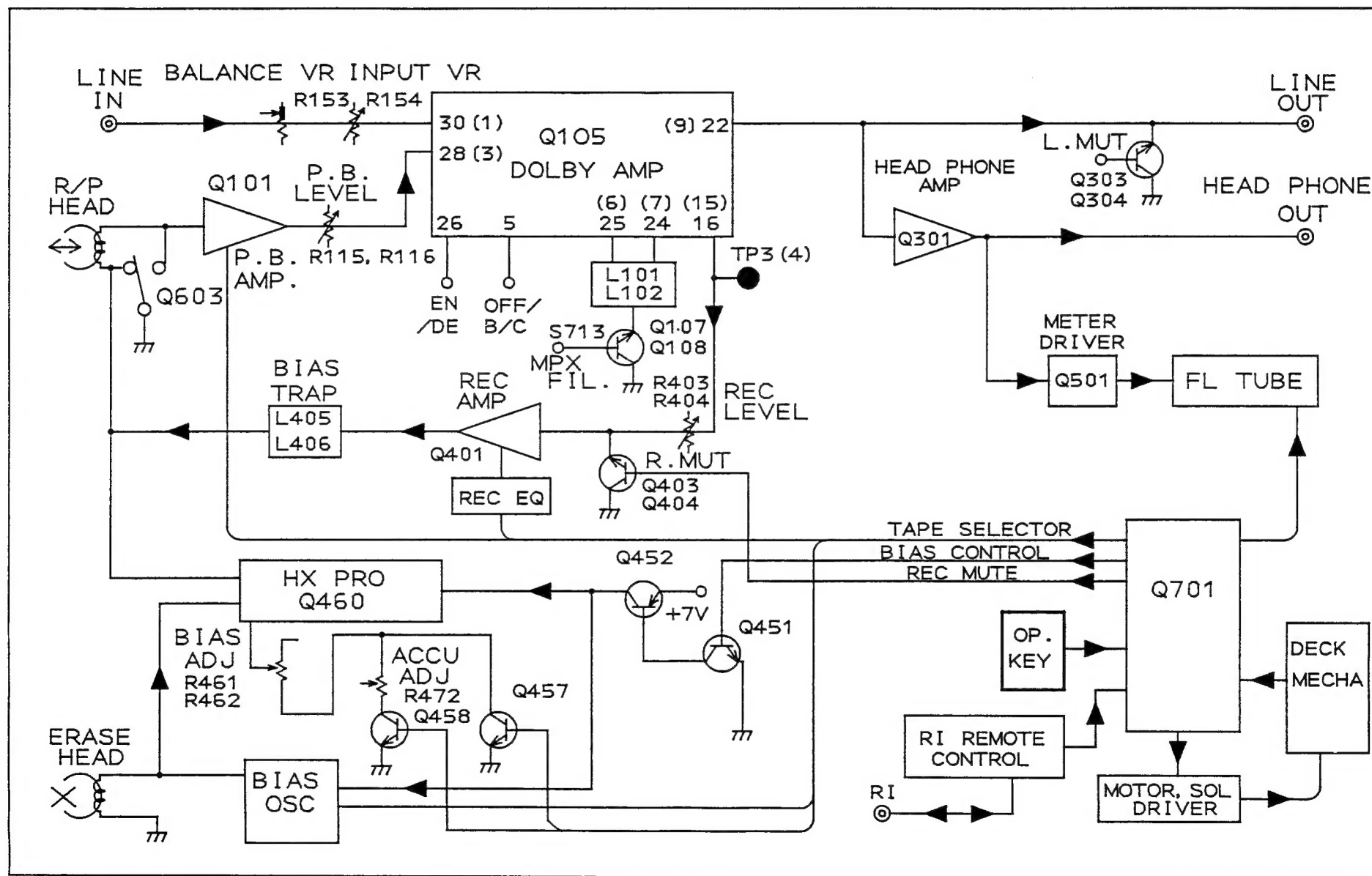
### SPECIFICATIONS

Track Format:	4-tracks, 2-channels
Erasing System:	AC erase
Tape Speed:	4.8 cm/sec. (1-7/8 i.p.s.)
Wow and Flutter:	0.07% (WRMS)
Frequency Response:	20-17,000Hz (Normal) (30-16,000Hz $\pm$ 3dB) 20-18,000Hz (High) (30-17,000Hz $\pm$ 3dB) 20-19,000Hz (Metal) (30-18,000Hz $\pm$ 3dB)
S/N Ratio:	58dB (metal tape, Dolby NR off) A noise reduction of 10dB above 5kHz and 5dB at 1kHz is possible with Dolby B NR. A noise reduction of 20dB at 5kHz is possible with Dolby C NR.
Input Jacks:	Line IN: 2 Input sensitivity: 80mV Input impedance: 50kohms
Outputs:	Line OUT: 2 Standard output level: 500mV (0dB) Optimum load impedance: over 50 kohms Headphone jack: 1 Optimum load impedance: 8 to 200 ohms
Motors:	DC servo motor: 1 DC motor: 1
Heads:	REC/PB: Special Hard Permalloy x 1; Erase head: Ferrite x 1
Power Supply Rating:	AC 230V, 50Hz
Power Consumption:	16 watts
Dimensions:	455(W) x 120(H) x 308(D)mm (17-15/16" x 4-3/4" x 12-1/8")
Weight:	5.0kg. (11.0 lbs.)

Specifications and external appearance are subject to change without notice because of product improvements.

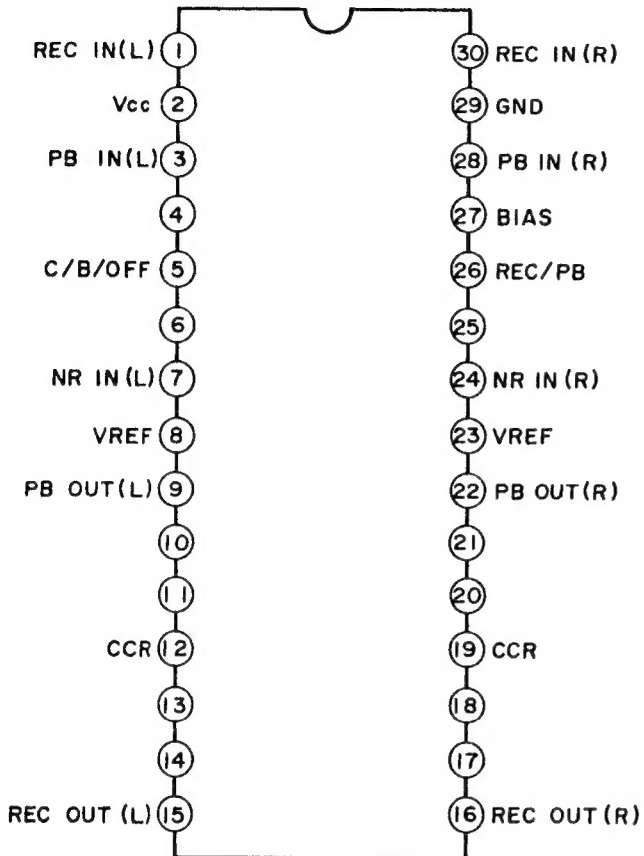
**ONKYO.**  
**AUDIO COMPONENTS**

## BLOCK DIAGRAM

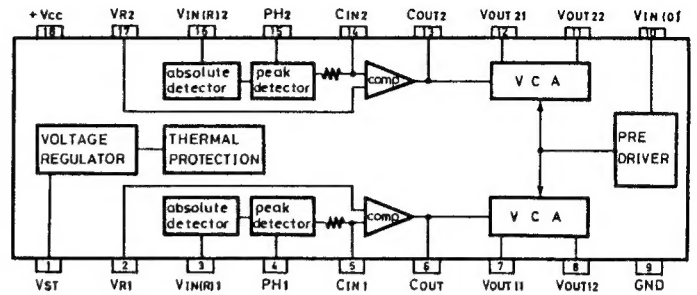


# IC BLOCK DIAGRAM

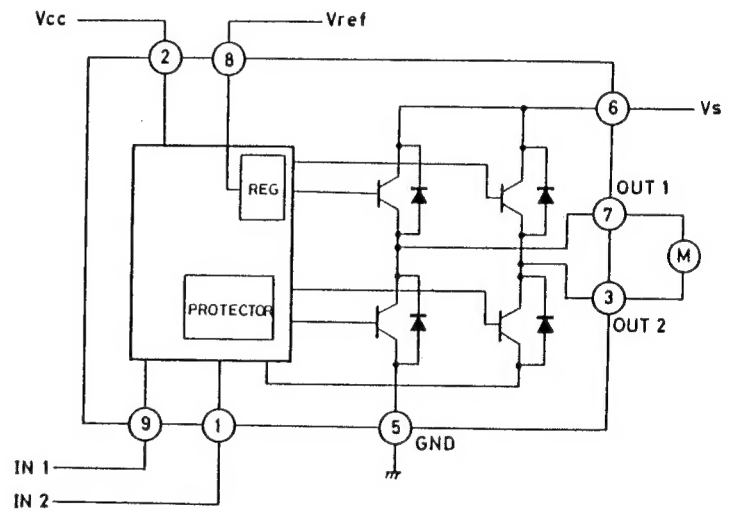
## HA12142NT (DOLBY, NR)



## μPC1297CA (HX PRO)

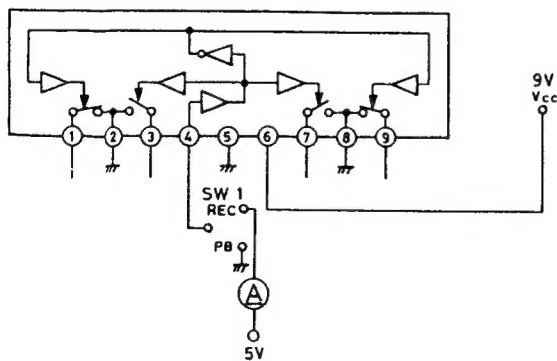


## TA7291S (MOTOR DRIVE)

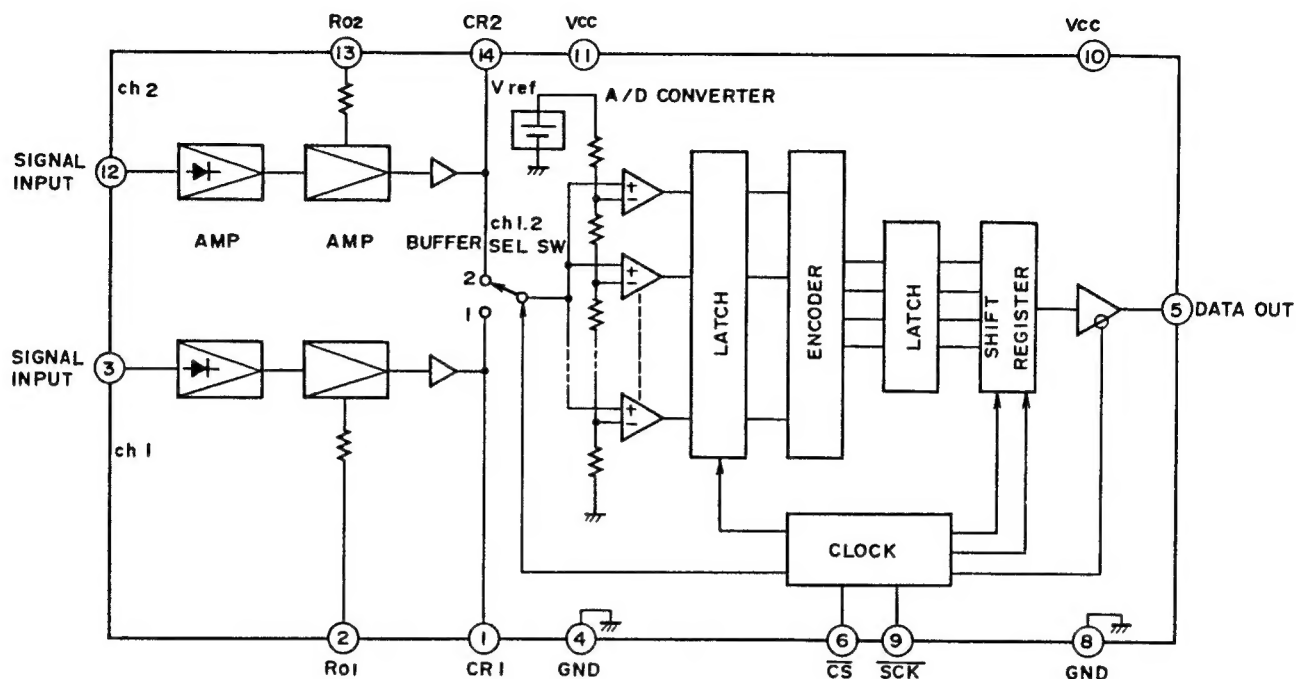


INPUT		OUTPUT		MODE
IN 1	IN 2	OUT 1	OUT 2	
0	0	∞	∞	STOP
1	0	H	L	CW/CCW
0	1	L	H	CCW/CW
1	1	L	L	BRAKE

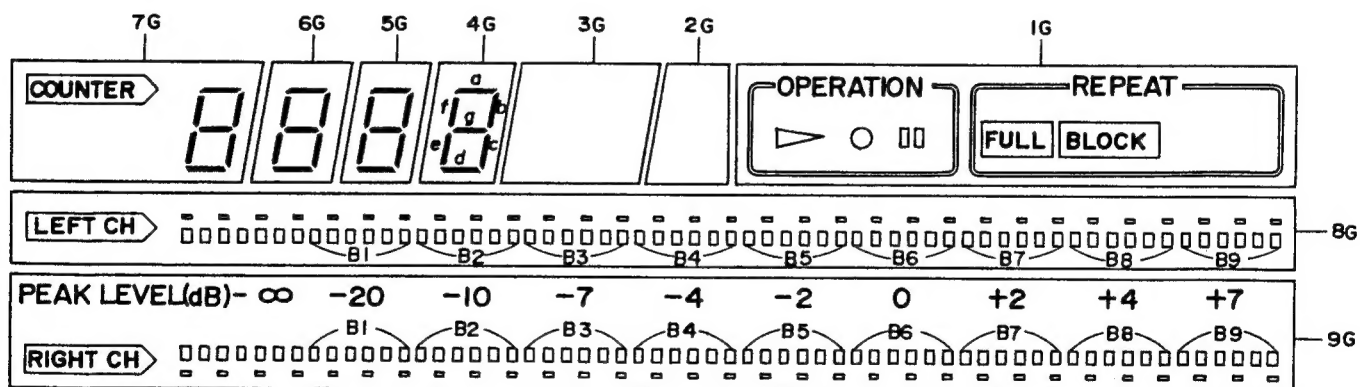
## μPC1330HA (REC/PB)



## M62302P (METER DRIVE)



## BG-924GK (DISPLAY TUBE)



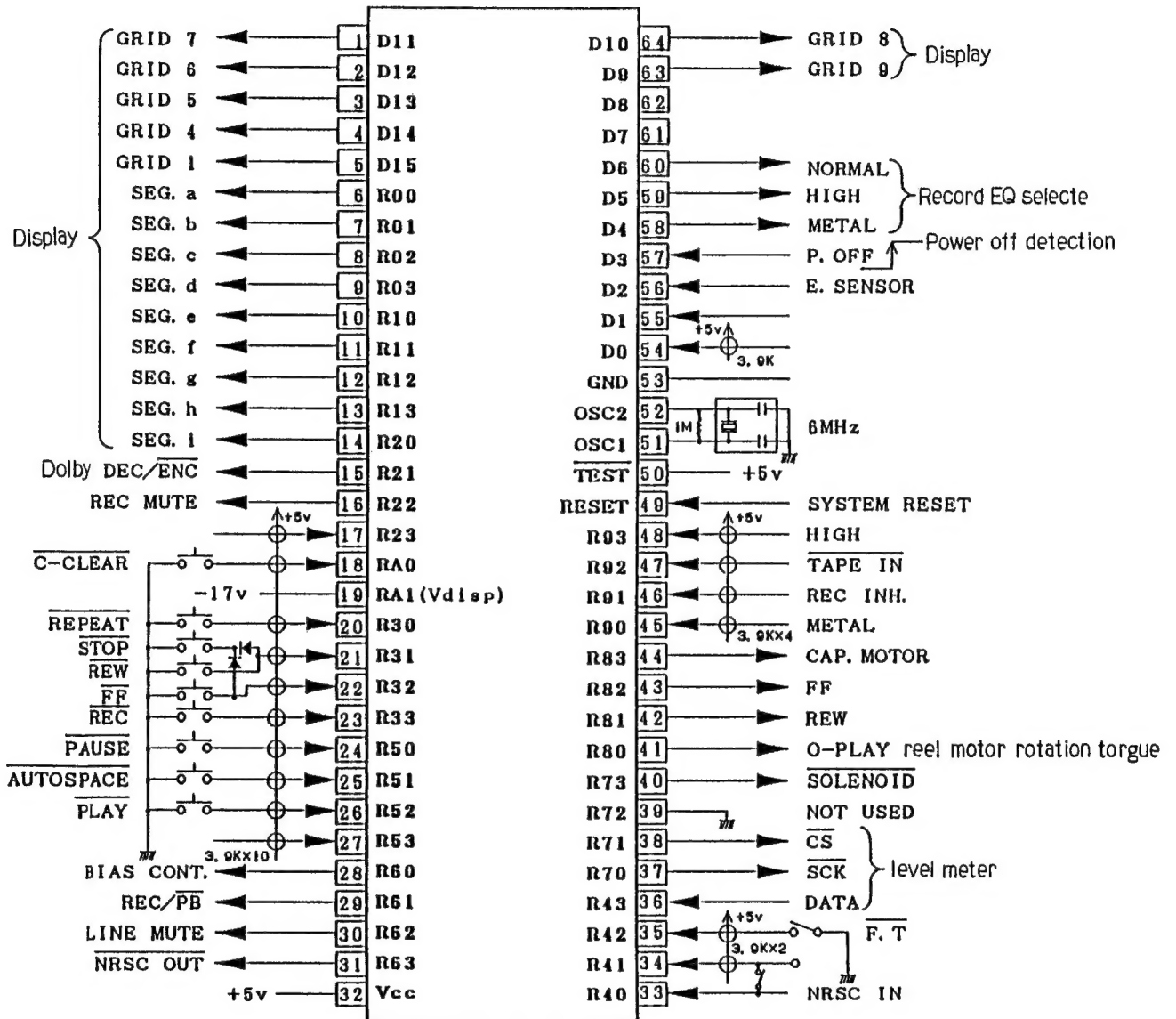
## PIN CONNECTION

PIN NO.	44	43	33	32	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
CONNECTION	F	F	N	N	P	P	P	P	P	P	P	P	P	P	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	F

# MICRO COMPUTER

HD614049SA88 (1 ~ 14800)

HD614049SB03 (14801 ~)



## ADJUSTMENT PROCEDURES

### PRECAUTIONS

1. Before adjustment, clean the following parts with an alcohol moistened swab.

- \* record/playback head
- \* erase head
- \* pinch roller
- \* capstan

2. Do not use magnetized screwdriver for adjustments.

3. Demagnetize record/playback head with a head demagnetizer.

### TEST EQUIPMENT/TOOLS REQUIRED:

Audio oscillator

Digital frequency counter

Oscilloscope

Attenuator

AC voltmeter

Non-magnetic screw driver

Test tapes

TCC-153 : 10 KHz, -15dB

MTT-111 : 3 kHz, -10dB

MTT-150 : Dolby level calibration  
400Hz, tone 200nWb/in

Item		Connection of instrument	Line input	Test tape	Mode	Output indicator	Adjustment point	Adjust	Remarks
1	Tape speed	Frequency counter to LINE output terminal		MTT-111	PB	Frequency counter	Semi-fixed on the moter	3005±10Hz	
2	Head azimuth	AC voltmeter and oscilloscope to LINE output terminal		TCC-153	PB	AC voltmeter	Haed azimuth screw	Maximum and same phase at channels L and R	fig-1
3	Playbac k level	AC voltmeter to terminals TP-3 and TP-4		MTT-150	PB	AC voltmeter	R115(Ch.L) R116(Ch.R)	300mV	
4	OSC Block	Frequency counter to P401 read loose coupling		METAL TAPE MX-C90	REC	Frequency counter	L453	85kHz±2kHz	
5	HX-PRO	AC voltmeter to terminals TP-1 and TP-2		METAL TAPE	REC	AC voltmeter	L-451(ch.L) L-452(ch.R)	Maximum	R-461 R-462 maximum
6	Bias current	fig-2	1kHz, -20dB and 12kHz, -20dB	XL-II C-90	REC/PC	AC voltmeter	R461(Ch.L) R462(Ch.R)	Same level at REC/PB	Input VR maximum.
7	Record level	fig-2	1kHz	XL-II C-90	REC	AC voltmeter	Attenuator or AF OSC output	350mV	
					REC/PB	AC voltmeter	R403(Ch.L) R404(Ch.R)	Same level at REC/PB	

Blank tape

NORMAL .....UD-1 C-90

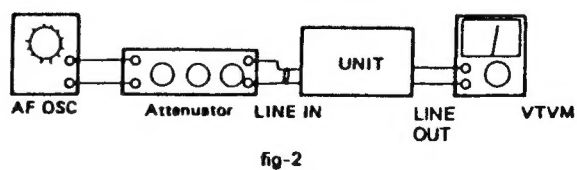
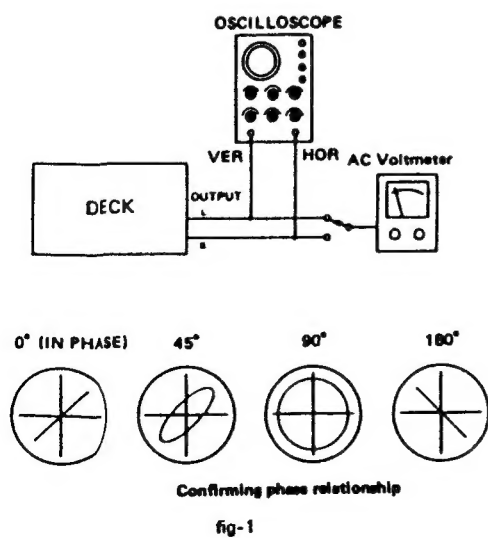
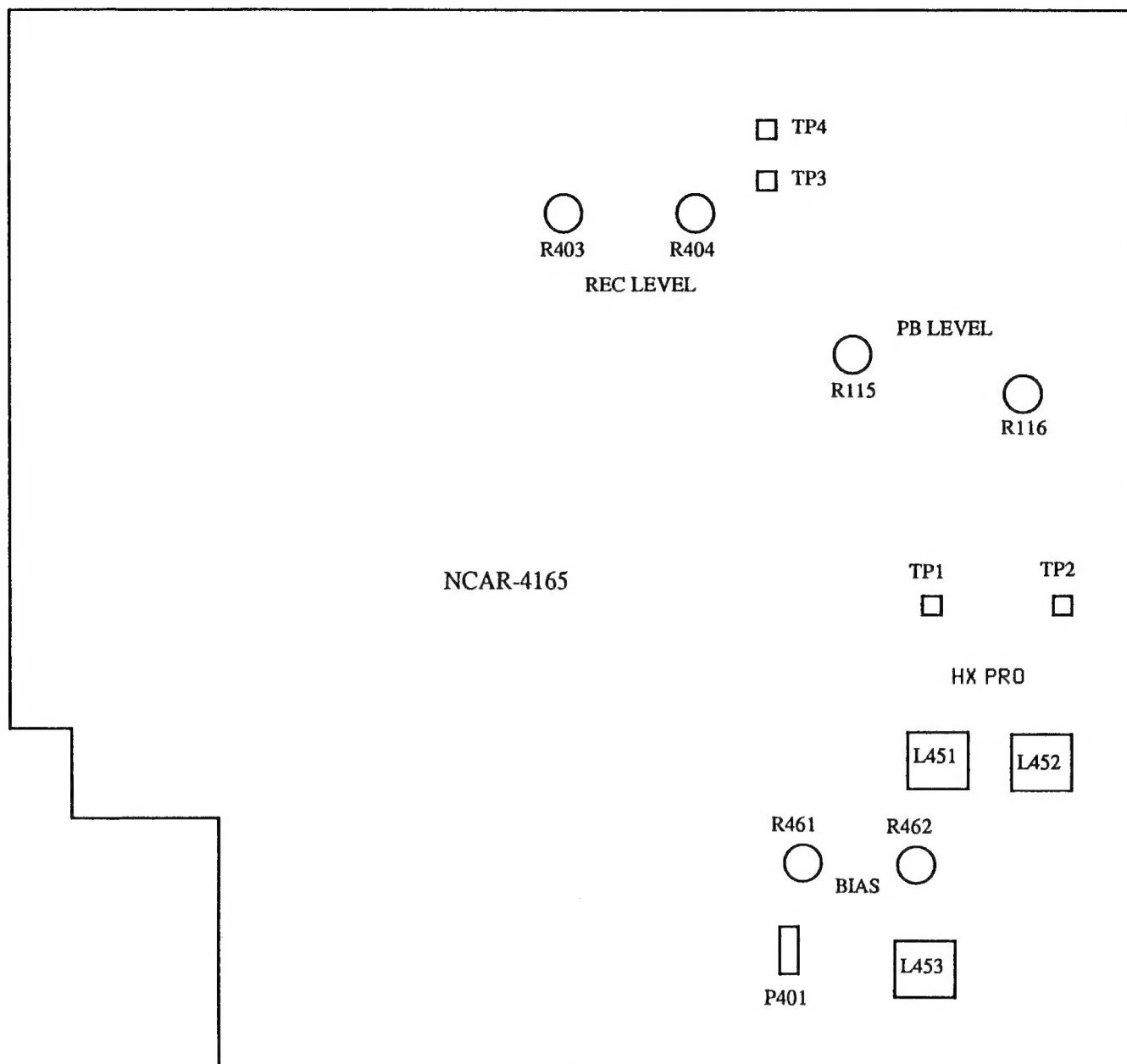
HIGH .....XL-5II C-90

METAL .....MX C-90



PLAY torque.....30 ~ 70g/cm

FF. REW torque.....80 ~ 180g/cm

Back tension .....2 ~ 7g/cm




# CHASSIS-EXPLODED VIEW PARTS LIST

REF. NO.	PART NO.	DESCRIPTION	REF. NO.	PART NO.	DESCRIPTION
A1	27110633	FRONT BRACKET AS (B)	A524	27175254	LEG AS
	27110634	FRONT BRACKET AS (S)	P901	 253149	AC CORD AS-CEE
A4	28400282	DAMPER	T901	 2300643	NPT-1105P
A5	27180478	SPRING (B)	U1	1N102565-1	NAAR-4165-1
A9	27130646C	BRACKET (F)	U2	1N102566-1	NADIS-4166-1
A12	28400473-1A	FRAME AS (CASSETTE)	U3	1N102567-1	NAPS4167-1
-a	28400463B	FRAME (CASSETTE)	U4	1N102568-1	NAETC-4168-1
-b	27180435	SPRING	Z1	244152	NDM-142,CASSETTE DECK
-c	28141109	CUSHION			MECHANISM
A15	27130608D	BRACKET (PT)			
A16	27273137	JOINT (EJ)			
A21	27100233	CHASSIS			
A23	27121432-2	BACK PANEL			
A24	27300750	BUSHING (CORD)			
A27	27190408	HOLDER			
A28	830440089	TAP-TIGHT SCREW 4TTC+8C(BC)			
A29	834430088	TAP-TIGHT SCREW 3TTS+8B(BC)			
A30	833430080	TAP-TIGHT SCREW 3TTP+8P(BC)			
A31	831130088	TAP-TIGHT SCREW 3TTW+8B			
A32	835430068	TAP-TIGHT SCREW 3TTF+6B(BC)			
A35	870065	PT WASHER			
A301	28184479	TOP COVER			
A302	28140837	CUSHION 250 × 10 × 9t			
A501	1N104121	FRONT PANEL (B)			
	1N105121	FRONT PANEL (S)			
A506	28191594A	CLEAR PLATE			
A509	27267708A	GUIDE (DOL) (B)			
	27267709A	GUIDE (DOL) (S)			
A512	28400640	CASSETTE LID AS (B)			
-a	28400637	CASSETTE LID (B)			
-b	28400625	WINDOW (B)			
A512	28400641	CASSETTE LID AS (S)			
-a	28400638	CASSETTE LID (S)			
-b	28400656	WINDOW (S)			
A513	28323985	KNOB (EJ) (B)			
	28324337	KNOB (EJ) (S)			
A514	28324325	KNOB (DOL) (B)			
	28324326	KNOB (DOL) (S)			
A516	28324150-1	KNOB (LEV) (B)			
	28324151	KNOB (LEV) (S)			
A517	28324335	KNOB (INP) (B)			
	28324336	KNOB (INP) (S)			
A521	28324140	KNOB (POW) (B)			
	28324184	KNOB (POW) (S)			
A522	27273136	JOINT (POW)			

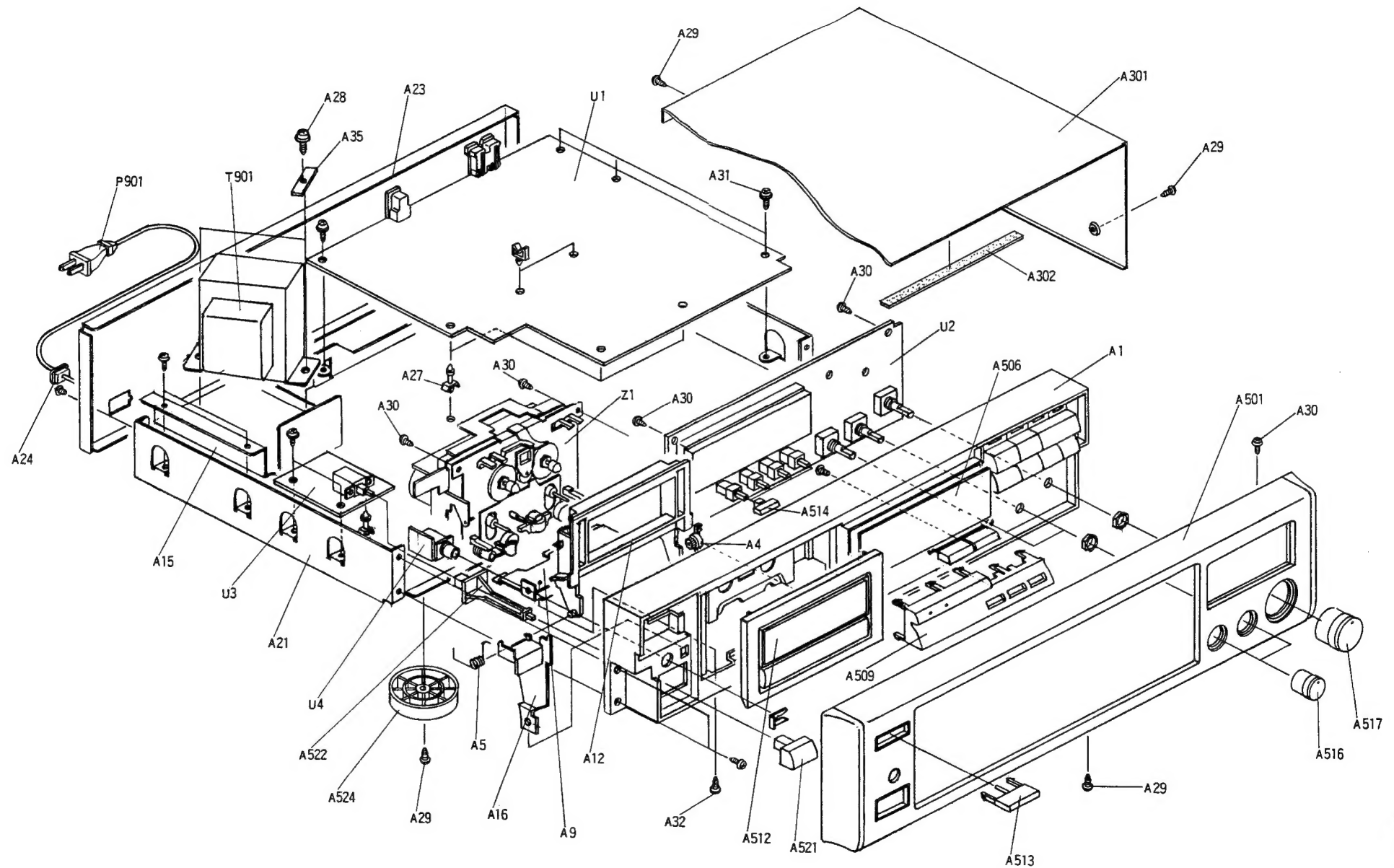
## NOTE

(B) : Black Model  
(S) : Silver Model

NOTE: THE COMPONENTS IDENTIFIED BY MARK  ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.



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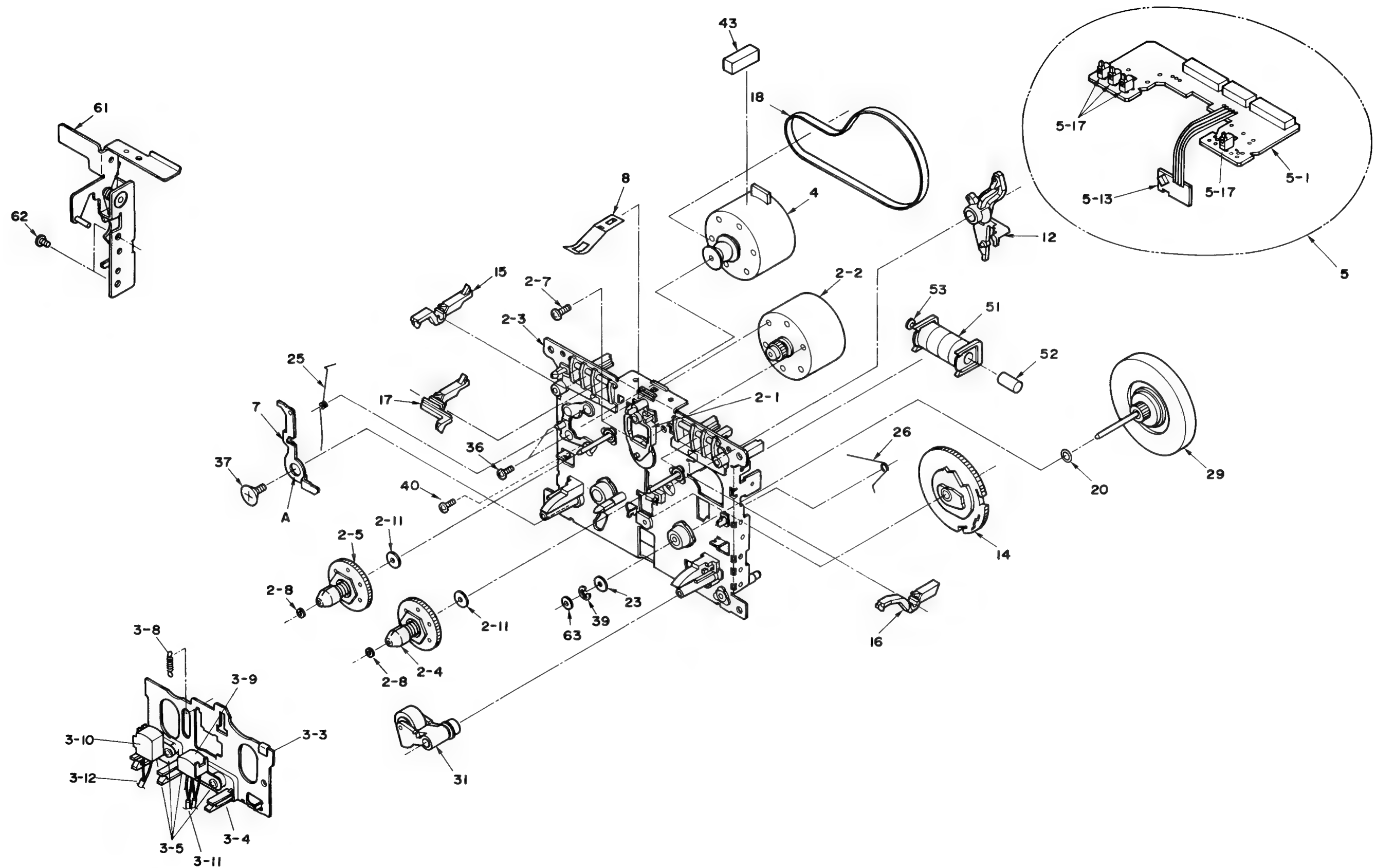


## TAPE MECHNISM PARTS LIST

REF.NO.	PARTS NO.	DESCRIPTION
2	24611448	MECHANISM CHASSIS AS
2-1	24602482	IDLER AS
2-1	24601245	REEL MOTOR
2-3	24611382B	BASE AS (CHASSIS)
2-4	24602483	BASE AS (REEL)
2-5	24602484	BASE AS (REEL)
2-7	24609032	PAN HEAD SCREW 2.6 × 6.4ZN
2-8	24611177	PLASTIC WASHER 1.7 × 3.2 × .25
2-11	24611175	PLASTIC WASHER 2.1 × 7 × .25
3	24600109	HEAD PLATE AS
3-3	24611501	BASE (HEAD)
3-4	24611502	SPEACER
3-5	24609051	SCREW 2.0 × 9ZN
3-8	24605711	SPRING
3-9	24600067	R/P HEAD
3-10	24600032	E HEAD
3-11	24606466	LEAD WIRE (R/P)
3-12	24606467	LEAD WIRE (E)
4	24601253A	MAIN MOTOR AS
5	24606469	P.C.B. AS (CONTROL)
5-1	24606425	BASE AS (P.C.B.)
5-13	24606463	PHOTO REFLECTOR
5-17	24606271	PUSH SWITCH
7	24607102	ARM (PROTECT) L
8	24605739	SPRING
12	24607101	ARM (PLAY)
14	24602485A	CAM GEAR (3R)
15	24603365A	LEVER (REC)
16	24603366	LEVER (PACK) L
17	24603367	LEVER (METAL) L
18	24602539	MAIN BELT
20	24611041	PLASTIC WASHER 2.6 × 0.25
23	24610841	PLASTIC WASHER 2.6 × 4.7 × .5
25	24605714	SPRING
26	24605716	SPRING
29	24602487	FLYWHEEL AS
31	24602414C	PINCH ROLLER AS (R)
36	24611306	PAN HEAD SCREW 2.6 × 6ZN
37	24609006A	SCREW
39	8930151	E WASHER 1.5S
40	838130080	WAVE SCREW 3 × 8
43	24611488	CUSHION (HOLDER)
51	24606333	SOLENOID COIL AS
52	24606332A	CORE
53	24606331	PLANGER
61	24611449	PLATE HOLDER AS
62	833126049	TAP-TIGHT SCREW 2.6TTP+4C
63	24611188A	WASHER (OIL SEAL)
69	838126080	SCREW 2.6 × 8
70	24611323	LUG
71	24609042	S-TIGHT SCREW M2.6 × 25

A B C D E F G H

**TAPE MECHANISM-EXPLODED VIEW**



## PC BOARD PARTS LIST

## NAAR-4165-1

CIRCUIT NO.	PARTS NO.	DESCRIPTION
<b>Ics</b>		
Q101	222956	NJM-2068D-D
Q105	22240388	HA12142NT
Q301	22240368	M5218AL
Q401	22240369	M5218AP
Q402	22240240	IR2C30
Q460	222959	$\mu$ PC1297CA
Q501	22240461	M62302P
Q603	22240147	$\mu$ PC1330HA
Q701	22240460	HD614049SA88(1 ~ 14800)
	22240484	HD614049SAB03 (14801 ~)
Q708	22240239	TA-7291S
Q901	222780075MIT	78M07L(1 ~ 2517)
	222780065JRC	78M06 (2518 ~)
Q902	222790075MIT	79M07L(1 ~ 2517)
	222790065JRC	79M06 (2518 ~)
Q905	222780055MIT	78M05
<b>Transistors</b>		
Q103, Q104	2213284 or 2213285	2SC1740S-R or 2SC1740S-S
Q106-Q108	221281 or 2213570	DTC114YS or RN1207
Q303, Q304	2211706	2SD655-F
Q403, Q404	2212794 or 2212795	2SD1468-R or 2SD1468-S
Q451	221281 or 2213570	DTC114YS or RN1207
Q452	2212853 or 2212855	2SB1068-K or 2SB1068-U
Q453	2211544	2SC1959-Y
Q454, Q455	221281 or 2213570	DTC114YS or RN1207
Q456	2211544	2SC1959-Y
Q457, Q458	221281 or 2213570	DTC114YS or RN1207
Q601	2211455	2SA1015-GR
Q602	221281 or 2213570	DTC114YS or RN1207
Q702	221281 or 2213570	DTC114YS or RN1207
Q703	2212853 or 2212855	2SB1068-K or 2SB1068-U
Q704	2212600 or 2213580	DTA124ES or RN2203
Q705	221281 or 2213570	DTC114YS or RN1207
Q706	2212853 or 2212855	2SB1068-K or 2SB1068-U
Q707	221281 or 2213570	DTC114YS or RN1207
Q709	2211255	2SC1815-GR
Q710	2212600 or 2213580	DTA124ES or RN2203
Q713, Q714	2211255	2SC1815-GR
Q801	2211945	2SK246-GR
Q903	2211255	2SC1815-GR
Q904	2202115 or 2202116	2SD2061-E or 2SD2061-F
Q906	2211455	2SA1015-GR
Q907	2212600 or 2213580	DTA124ES or RN2203
Q908	2211455	2SA1015-GR

CIRCUIT NO.	PARTS NO.	DESCRIPTION
<b>Diodes</b>		
D601-D610	223163	1SS133
D701, D704	223163	1SS133
D702	224150752	05AZ7.5Y
D703	224150433	05AZ4.3Z
D705	224150562	05AZ5.6Y
D901-D906	22380046	AM01Z
D907	224151303	05AZ13Z
D908, D909	223163	1SS133
D910	224150623	05AZ6.2Z
D911-D913	223163	1SS133
D914	224151803	05AZ18Z
D915	224150512	05AZ5.1Y
D916-D919	223163	1SS133 (2518 ~)
<b>Coils</b>		
L101, L102	233313	NMC-6048
L401, L402	231086	NCH-2134
L403, L404	231082	NCH-2130
L405, L406	231165	NTR-6506
L451, L452	231127	NCH-4183
L453	231180	NLO-2053
X701	3010149	CST6.00MGW
<b>Capacitors</b>		
C111-C113	391942217	220 $\mu$ F16V, ELECT.
C115	391942217	220 $\mu$ F16V, ELECT.
C119-C122	391980227	2.2 $\mu$ F50V, ELECT.
C125, C126	391980227	2.2 $\mu$ F50V, ELECT.
C133-C136	391981097	0.1 $\mu$ F50V, ELECT.
C137, C138	391980227	2.2 $\mu$ F50V, ELECT.
C139, C141	391942217	220 $\mu$ F16V, ELECT.
C143	391980477	4.7 $\mu$ F50V, ELECT.
C151, C152	391941007	10 $\mu$ F16V, ELECT.
C301, C302	391941007	10 $\mu$ F16V, ELECT.
C403, C404	391944707	47 $\mu$ F16V, ELECT.
C405, C406	391981097	0.1 $\mu$ F50V, ELECT.
C407, C408	391941007	10 $\mu$ F16V, ELECT.
C451	391921017	100 $\mu$ F6.3V, ELECT.
C452	391980477	4.7 $\mu$ F50V, ELECT.
C454	370131334	0.013 $\mu$ F100V, APS
C456	391980477	4.7 $\mu$ F50V, ELECT.
C459, C460	370131514	150PF 100V, APS
C471-C473	391941007	10 $\mu$ F16V, ELECT.
C501, C502	391980227	2.2 $\mu$ F50V, ELECT.
C503, C504	391980477	4.7 $\mu$ F50V, ELECT.
C601	391980477	4.7 $\mu$ F50V, ELECT.
C603	391980477	4.7 $\mu$ F50V, ELECT.
C604	391941017	100 $\mu$ F16V, ELECT.
C701	391941007	10 $\mu$ F16V, ELECT.
C703	391941017	100 $\mu$ F16V, ELECT.
C706	391982297	0.22 $\mu$ F50V, ELECT.
C906, C907	391952227	2200 $\mu$ 25V, ELECT.
C908, C909	391944717	470 $\mu$ F16V, ELECT.
C912	393156827	6800 $\mu$ F25V, ELECT.
C913, C914	391961017	100 $\mu$ F35V, ELECT.
C916	391942217	220 $\mu$ F16V, ELECT.
C918	391962207	22 $\mu$ F35V, ELECT.
C921	391980107	1 $\mu$ 50V, ELECT.
C924, C925	391961017	100 $\mu$ F35V, ELECT.
C926, C927	391980477	4.7 $\mu$ F50V, ELECT.
C928	391980107	1 $\mu$ 50V, ELECT.
C929, C930	391922217	220 $\mu$ F6.3V, ELECT (2518 ~)
<b>Resistors</b>		
R115, R116	5210220	N06HR50KBD
R403, R404	5210064	N06HR 10KBD

CIRCUIT NO.	PARTS NO.	DESCRIPTION
R461, R462	5210064	N06HR 10KBD
R702	49163392410	3.9K $\Omega$ $\times$ 10, 1/10W
R703	49163392405	3.9K $\Omega$ $\times$ 5, 1/10W
R709	442524704	RS1/2WBJ 47 $\Omega$
R903	442520224	RS1/2WBJ 2.2 $\Omega$
R904	442521004	RS1/2WBJ 10 $\Omega$
<b>Plug, jack, socket</b>		
P101	25055136	NPLG-6P120
P102, P103	25050267	NSCT-3P95
P105	25045329	NPJ-4PDBL183
P401	25055132	NPLG-2P116
P701	25045330	NPJ-2PDBL184
P702A, P704A	2002321020	NSAS-10P0241
P703A	2000962	NSAS-6P914
<b>Miscellaneous</b>		
	27160211	RAD-68, RADIATOR
	82143006	3P+6FN(BC), SCREW
	27141059	BRACKET
	27301271	MSC-1609, CLAMP

## NADIS-4166-1

CIRCUIT NO.	PARTS NO.	DESCRIPTION
<b>Display tube</b>		
Q751	212097	BG-924GK
<b>Diodes</b>		
D751, D752	223163	1SS133
<b>Resistors</b>		
R153	5104289	N14RGLC250KMN17Z
R154	5104251	N14RGL50KA17Z
R472	5104290	N14RGLC5KB17Z
<b>Switch</b>		
S701, S702	25035548	NPS-111-510
S704	25035548	NPS-111-510
S706-S711	25035548	NPS-111-510
S713-S715	25035611	NPS-122-L573
<b>Holder</b>		
	27190838	HOLDER(FL)

## NAPS-4167-1

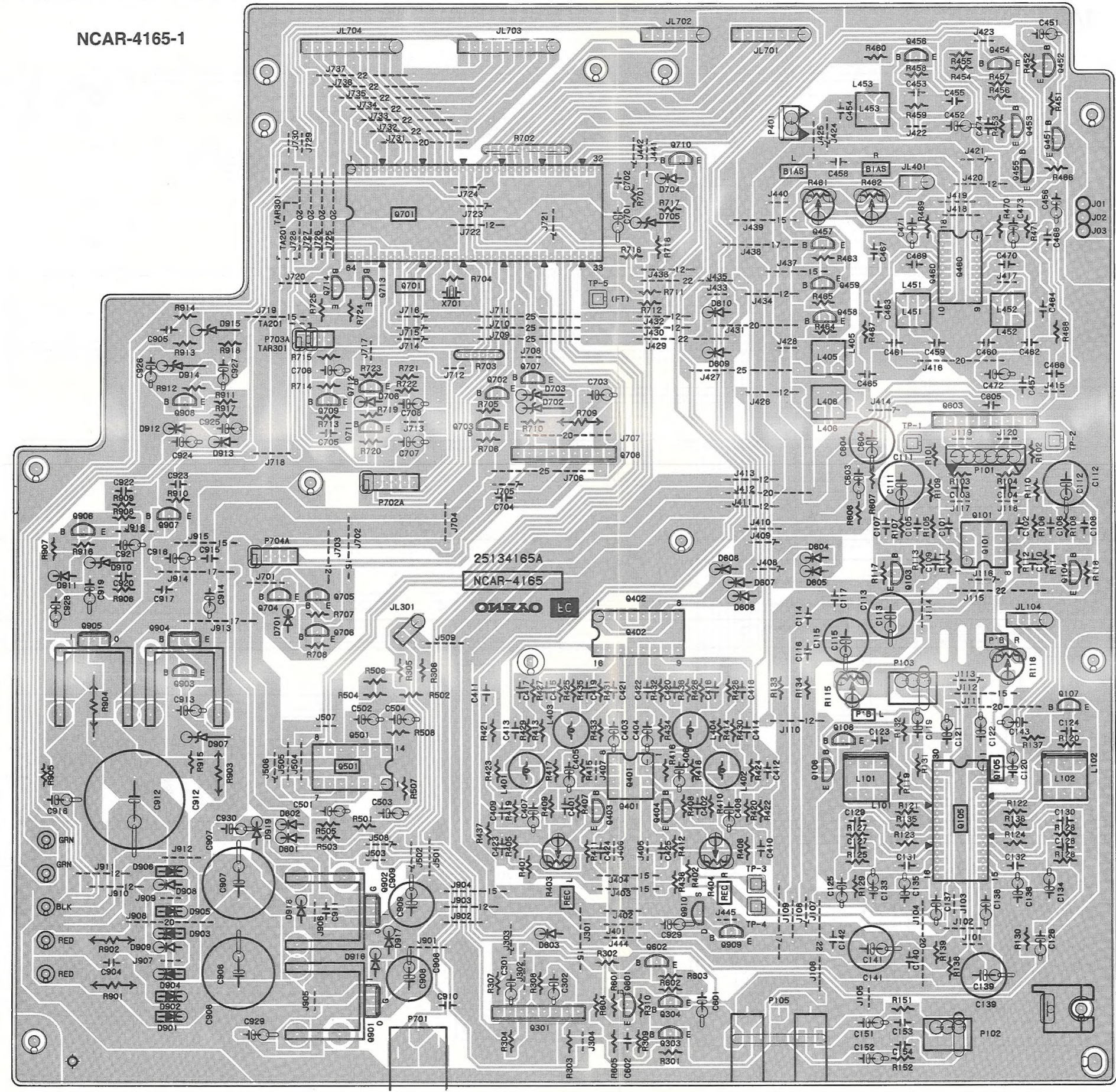
CIRCUIT NO.	PARTS NO.	DESCRIPTION
C901	3500065A	0.01 $\mu$ F, AC400V/125V, IS
S901	25035558	NPS-111-L520P
	25060092	NMT-1S33, TERMINAL

## NAETC-4168-1

CIRCUIT NO.	PARTS NO.	DESCRIPTION
P301	25045289	HLJ0540-01-010, ST-JACK

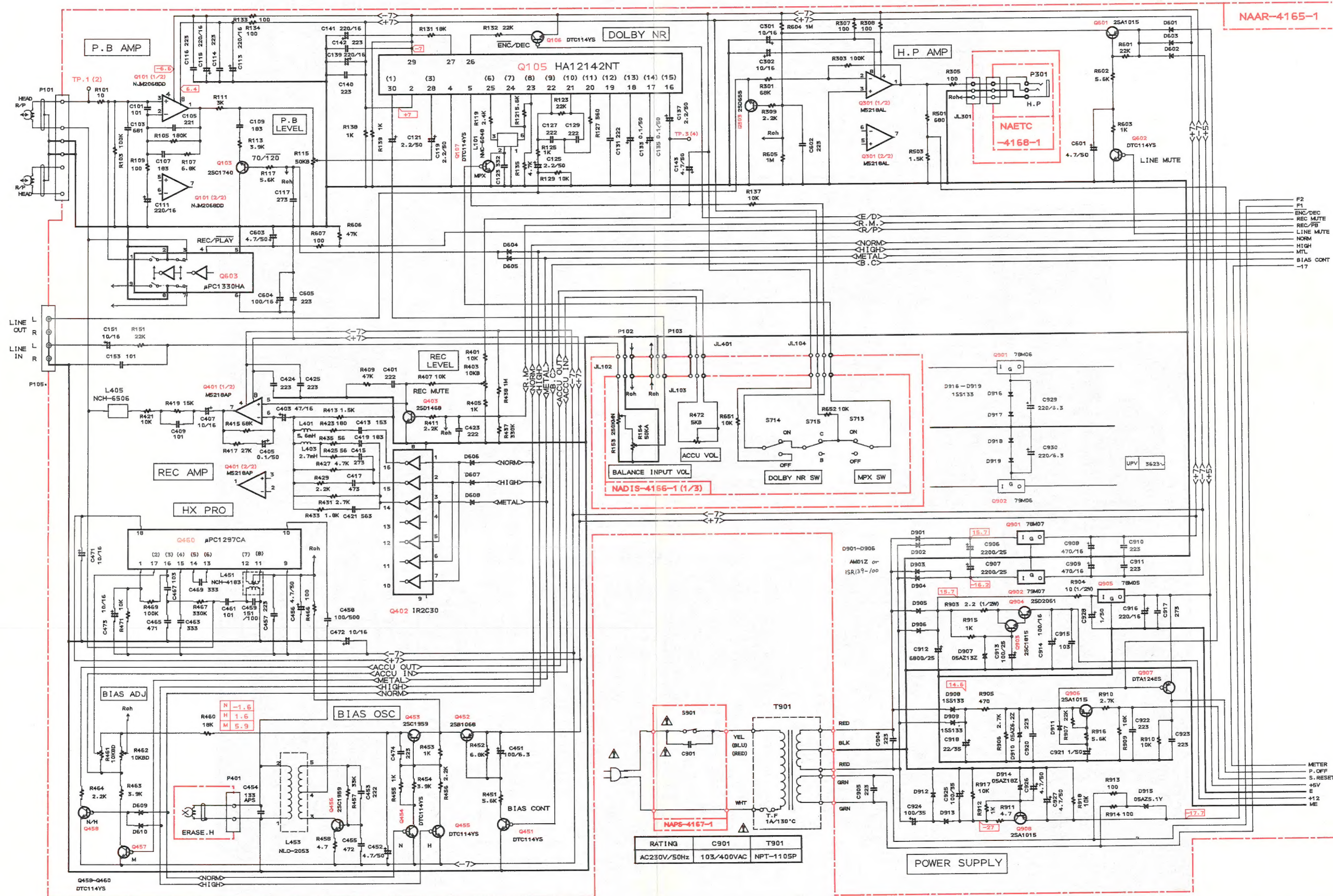


PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE





**SCHEMATIC DIAGRAM 1/2**





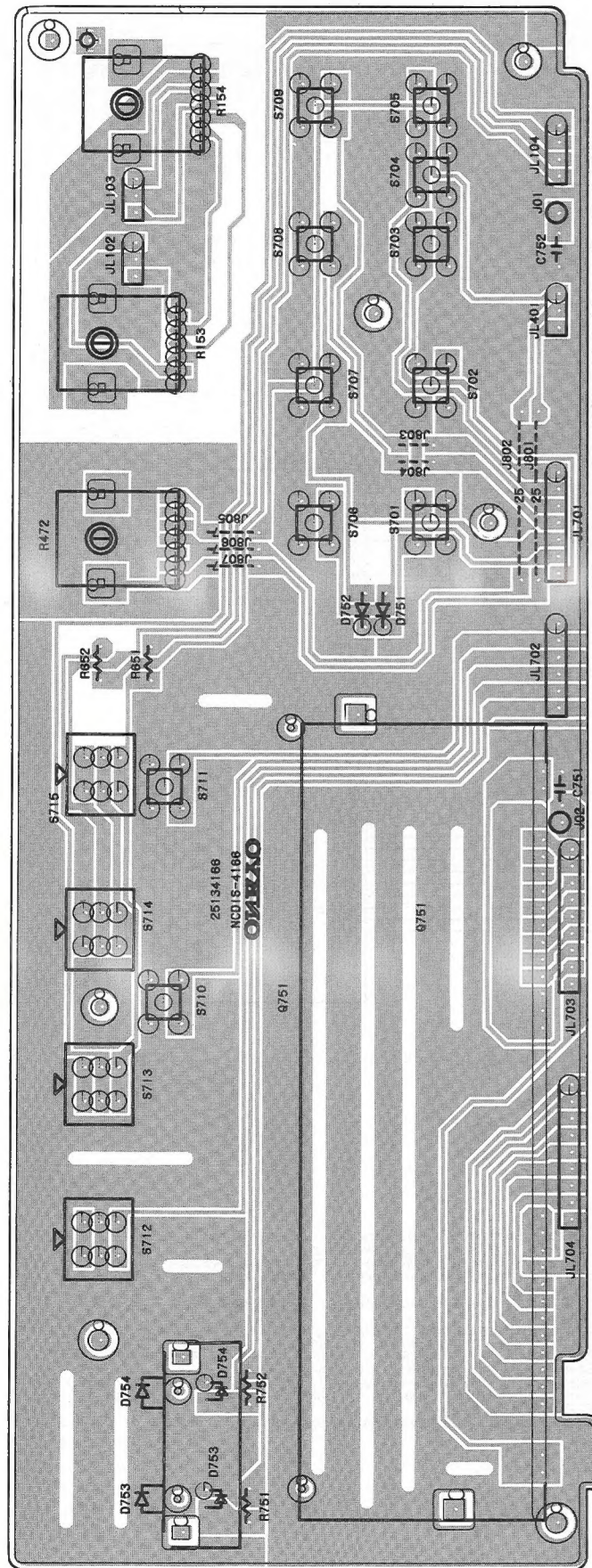
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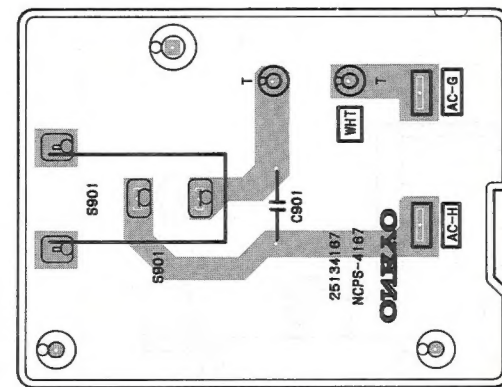


# PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE

NCDIS-4166-1



NCPS-4167-1



NCETC-4168-1

